

# NEW SPECIES OF *PETROPHILE* R. Br. (PROTEACEAE) FROM WESTERN AUSTRALIA.

by

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## ABSTRACT

Foreman, D. B. New species of *Petrophile* R. Br. (Proteaceae) from Western Australia. *Muelleria* 7(2): 301-310 (1990). *Petrophile helicophylla* D. Foreman, *Petrophile aspera* C. A. Gardner ex D. Foreman and *Petrophile stricta* C. A. Gardner ex D. Foreman from Western Australia are illustrated and described as new with notes on distribution and ecology. A short note on the application of the name *Petrophile biternata* is given.

## INTRODUCTION

During the preparation of the account *Petrophile* for the *Flora of Australia* several previously undescribed taxa from Western Australia were noted and the opportunity is taken here to formally recognise them. The occasion is also taken to briefly discuss *Petrophile biternata* and the identity of two taxa described by Sainsbury (1987) in his *A Field Guide to Isopogons and Petrophiles*.

## TAXONOMY

### *Petrophile helicophylla* D. Foreman, sp. nov.

*Frutex* prostratus, c. 0.35 m altus. *Folia* teretia, torsiva, 15-30 cm longa. *Inflorescentia* terminalis, sessilis pedunculata. *Bractea involucales* paucae, subulatae; squamae strobili ± late ovatae. *Flores* albi ad cremicolores ad pallide rosei, extra villosi. *Tepala* c. 35 mm longa. *Pollinis praebitor* sub peniculo turbinatus, peniculus dense tomentosus, apice glabro. *Strobili fructificantes* ± globosi ad elliptici, ad 2.5 cm longi. *Nuces* circulares ad transverse ellipticae, c. 2-2.75 mm longae, 2.5-3.0 mm latae, coma alba ad pallide ferruginea, 5 mm longa, praecipue in marginibus restricta.

TYPUS: Western Australia, 50 km N of South Coast Highway, on old Ravensthorpe Road, 23 November 1985, D. B. Foreman 1195 (HOLOTYPUS: MEL 1557967; ISOTYPI: AD, CANB, MEL 1557966, NSW, PERTH).

*Prostrate* branching and spreading *shrub*, c. 0.35 m tall, up to c. 1.6 m across. *Branchlets* glabrous. *Leaves* glabrous, smooth, terete, spirally twisted, 15-30 cm long, acute. *Inflorescence* terminal, sessile, or with a peduncle up to c. 2.5-3 cm long (excluding the flowers). *Involucral bracts* few, subulate; cone scales broad, ± broadly ovate, ± acute, glabrous. *Flowers* white, creamy white, pale cream-pink or pale pink, villous outside, glabrous and red inside. *Tepals* c. 35 mm long. *Pollen presenter* yellow c. 6-8 mm long, glabrous, turbinate below the brush, brush c. 4.5 mm long, narrow-conical, villous, with a glabrous tip c. 0.5 mm long. *Fruiting cones* ± globose to elliptical, 1.5-2.5 cm long. *Nuts* circular to transverse elliptical, c. 2-2.75 mm long, c. 2.5-3 mm wide, with a persistent beak up to c. 1-1.5 mm long, coma white or pale ferruginous, c. 5 mm long on the margins, shorter and less dense on adaxial surface, adaxial surface dark brown, abaxial surface glabrous, light brown. (Fig. 1)

### DISTRIBUTION (Fig. 2):

Scattered in the sandy heathlands north-west of Ravensthorpe and north-east of Jerramungup.

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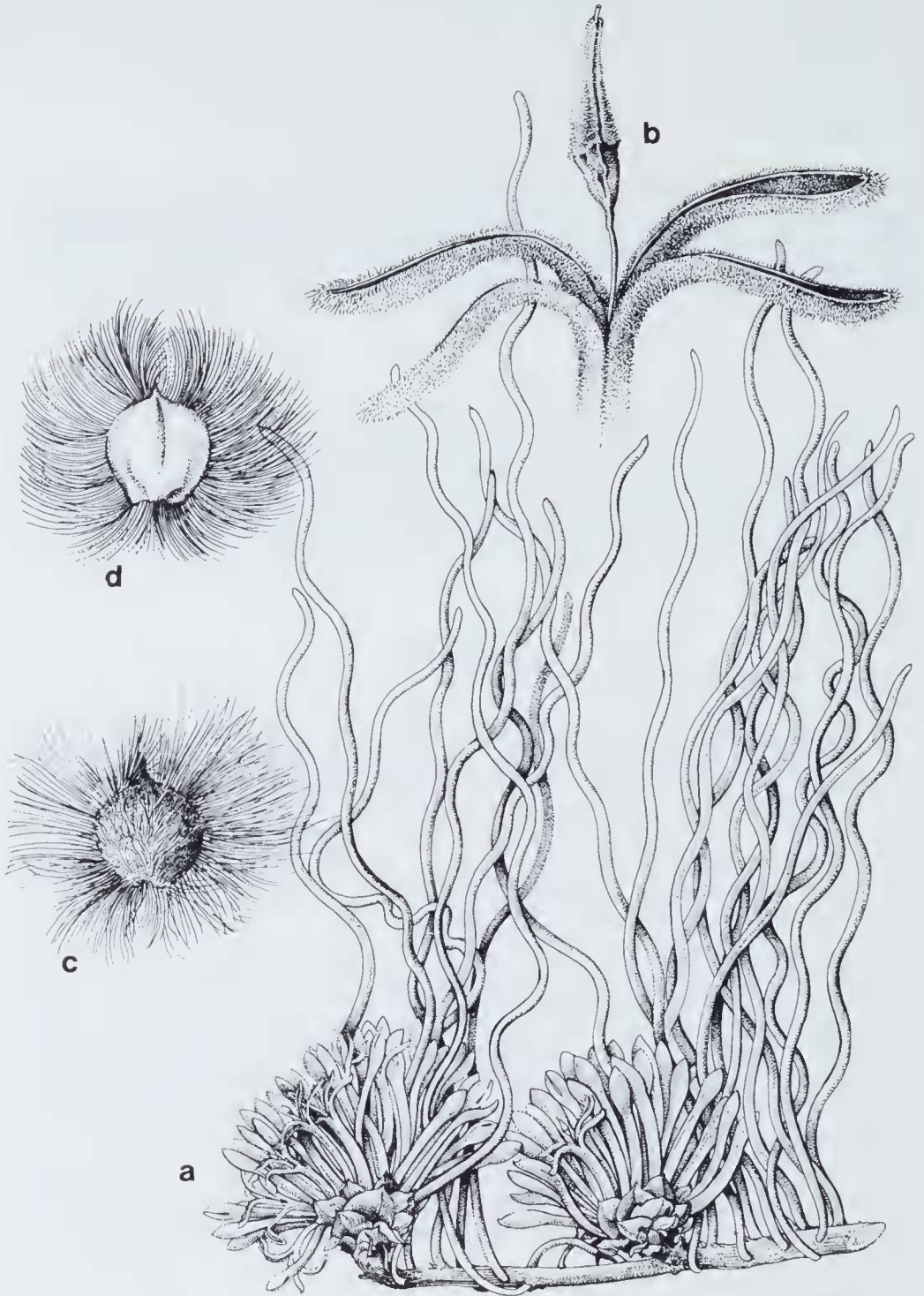


Fig. 1. *Petrophile helicophylla*. a—Flowering branch,  $\times 0.75$ . b—Limb of perianth and pollen presenter,  $\times 5$ . c—Adaxial view of fruit,  $\times 5$ . d—Abaxial view of fruit,  $\times 5$ . a, b drawn from the holotype; c, d drawn from A. S. George 7676.

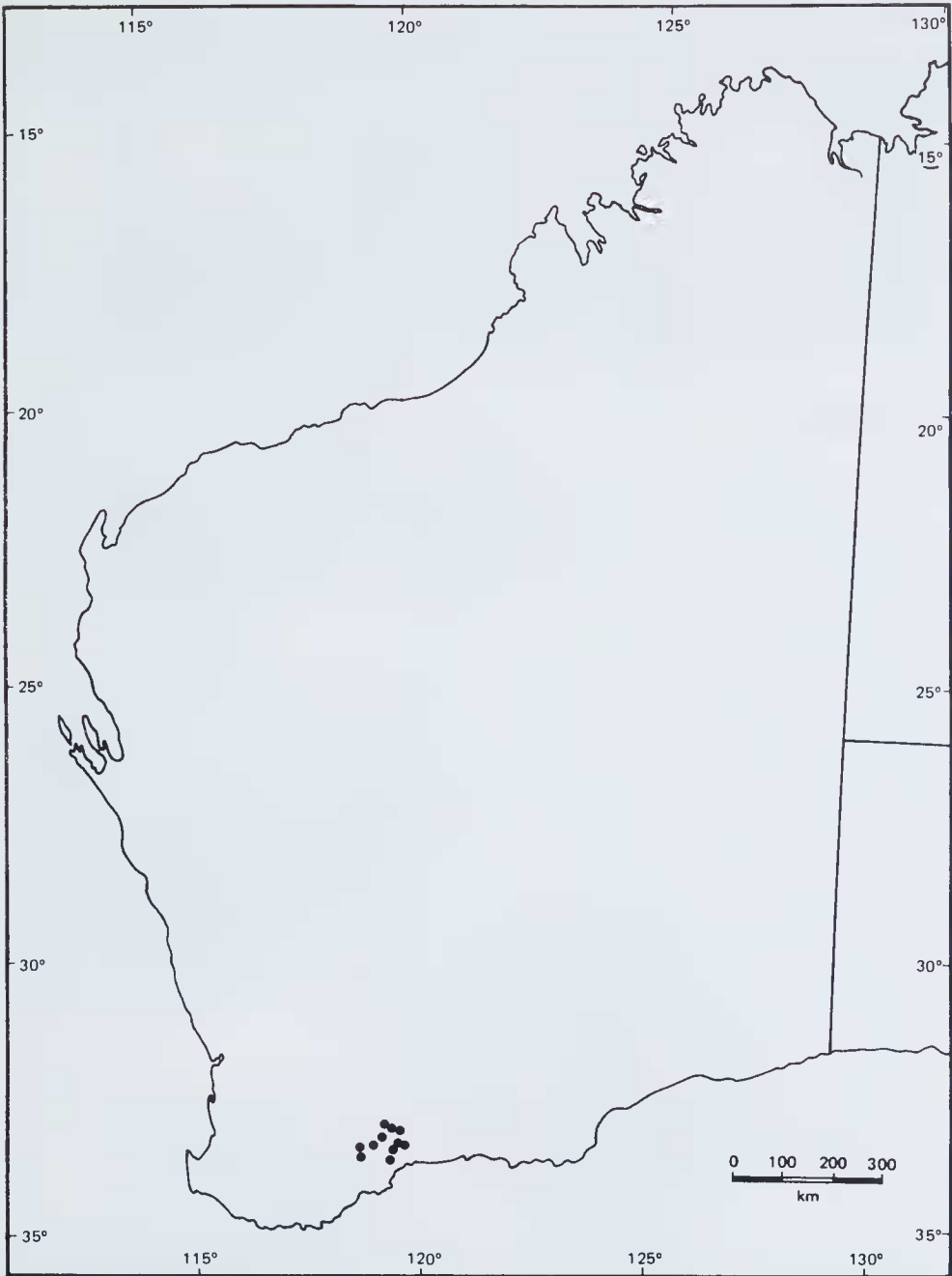


Fig. 2. Distribution of *Petrophile helicophylla*.

ECOLOGY:

Collectors notes include 'in sand, in low heath', 'in sandy clay near salt pans', 'heath on white sand', 'on lateritic heath', 'in sand, with low scrub' and 'well drained, deep white sand in tall open woodland'. Flowers October-February; fruits November-February, June.

## NOTES:

The specific epithet refers to the spirally twisted leaves which immediately distinguish it from other allied species such as *P. teretifolia*. The large creamish flowers which are red inside are also rather distinctive.

Some plants are known to occur in the Dunn Rock Nature Reserve, however the conservation status of other populations is unknown.

## SPECIMENS EXAMINED:

Western Australia—7 km W of Ravensthorpe, Lake King Road, 20 km S of Lake King, 10.i.1979, B. Barnsley 492 (CBG); 64 km E of Jerramungup, 7.xi.1978, R. J. Cranfield 1095 (PERTH); 14 miles W of Phillips River, 4.xi.1965, A. S. George 7312 (MEL, PERTH); about 33 miles E of Pingrup, A. S. George 7328 (PERTH); 18 miles SE of Lake King on Ravensthorpe Rd, 25.ii.1966, A. S. George 7676 (MEL, PERTH); 15 km N of Ravensthorpe-Ongerup road on Koornong Road, 26.x.1979, N. S. Lander 1092 (MEL, PERTH); 10.5 km N of Jerramungup, 27.vii.1974, K. Newbey 4239 (PERTH); 15 km NNE of Jerramungup, K. Newbey 4604 (MEL, PERTH).

***Petrophile aspera* C. A. Gardner ex D. Foreman sp. nov.**

*Frutex* humilis, 0.2–0.45 m, raro ad 1.3 m, altus. *Folia* exasperata, teretia, 15–30 cm longa, saepe vel ad apicem crispata vel per totam longitudinem parum torta. *Inflorescentia* terminalia sessilia. *Bracteeae involucales* lineari-lanceolatae; squamae strobili latae,  $\pm$  circulares ad late rhomboideae, apice nonnumquam reflexa. *Flores* pallide-rosei ad albi ad pallide-lutei, extra villosi, dulce redolentes. *Tepala* c. 20 mm longa. *Pollinis praebitor* turbinatus, sub peniculo truncatus, peniculus dense tomentosus ad villosus, apice glabro. *Strobili fructificantes*  $\pm$  elliptici c. 2.5 cm longi. *Nuces* late obovatae c. 2.5 mm longae, c. 2.5 mm latae, coma albidia ad pallidissime ferruginei, praecipue in marginibus, cum peniculo c. 2 mm longo in base.

TYPUS: Western Australia, 47 km E of Dumbleyung, 27 November 1978, A. S. George 15267 (HOLOTYPUS: MEL 1576171; ISOTYPI: CANB, NSW, PERTH).

*Low shrub*, usually 0.2–0.45 m tall, rarely up to 1.3 m tall. *Branchlets* glabrous. *Leaves* glabrous, roughened, terete, 15–30 cm long, often curled at apex or slightly twisted over their entire length,  $\pm$  shortly acute. *Inflorescence* terminal, sessile, 2.5 cm long (excluding the flowers). *Involucral bracts* linear-lanceolate; cone scales broad,  $\pm$  circular to broadly rhomboid, acuminate, glabrous, apex sometimes reflexed. *Flowers* pale pink, creamy-white, white, pale-yellow, villous outside, glabrous inside, sweetish scent. *Tepals* c. 20 mm long. *Pollen presenter* 5 mm long, glabrous, turbinate, truncate below the brush, brush 3–3.5 mm long, narrow-cylindrical, densely tomentose-villous with a glabrous tip 0.5–1 mm long. *Fruiting cones*  $\pm$  elliptical, up to about 2.5 cm long. *Nuts* broadly obovate, c. 2.5 mm long, c. 2.5 mm wide, with a persistent beak up to c. 1.5 mm long, coma whitish to very pale ferruginous, 4–5 mm long on the margins with a tuft about 2 mm long at the base, adaxial surface with a few scattered longish hairs, abaxial surface glabrous. (Fig. 3)

## DISTRIBUTION (Fig. 4):

Scattered over an area between Narrogin and Lake Grace to just north of the Stirling Range.

## ECOLOGY:

Collectors notes include 'in sand, in *Banksia*-low open woodland with heath', 'whitish sand, low open shrubland (1–1.5 m) of Proteaceae-Myrtaceae species with emergent mallee eucalypts', 'in gravel heath', 'in sandy laterite, with *E. macrocarpa*-heath association', 'sandplains', and 'sandy gravel'. Flowers August–November; fruits September–October.

## NOTES:

The specific epithet refers to roughened texture of the leaves, due to the presence of short hard projections, which distinguish *P. aspera* from *P. teretifolia*. Another feature which distinguishes the former from the latter is a tendency of the leaves to curl at the apex.

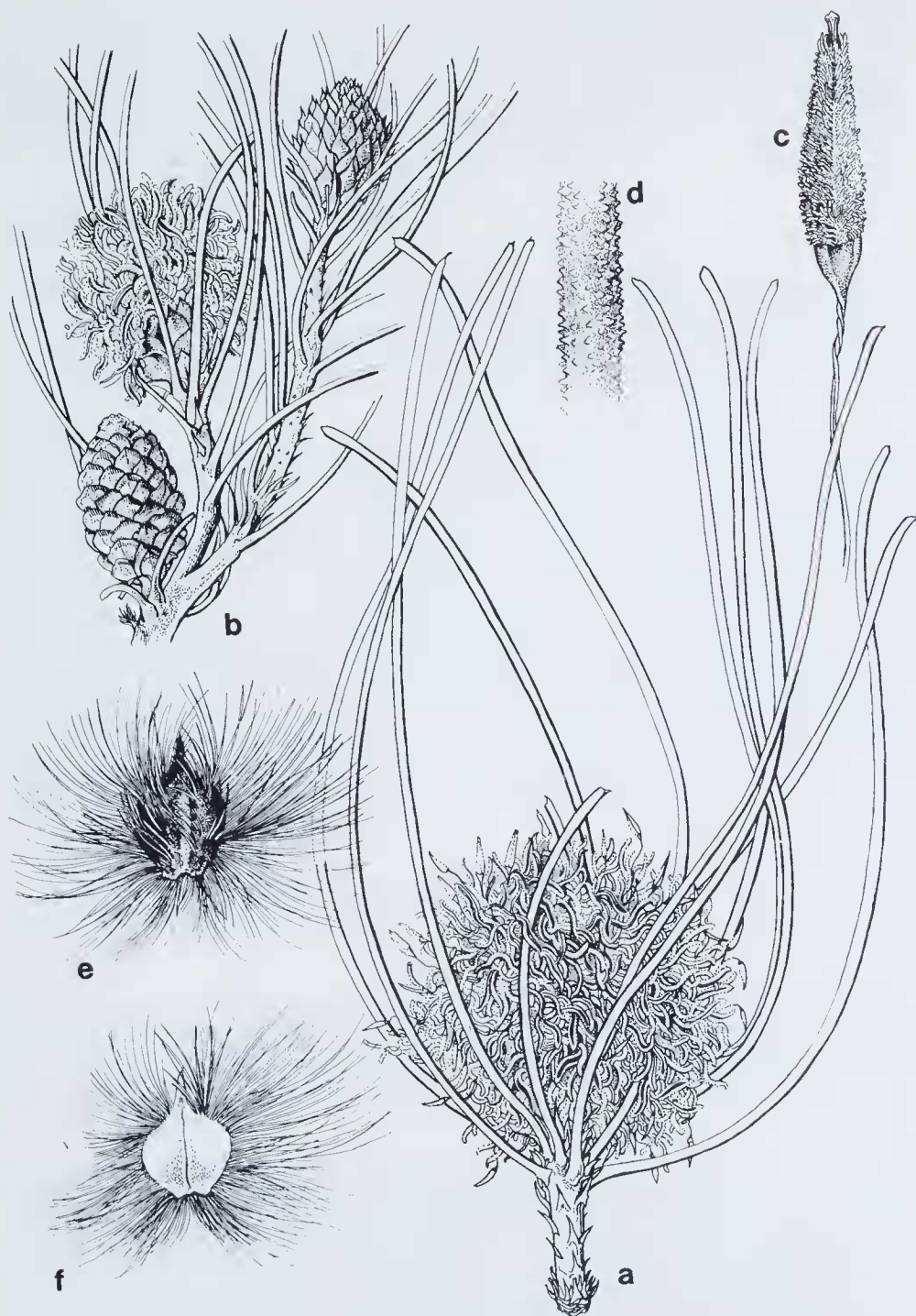


Fig. 3. *Petrophile aspera*. a—Flowering branch,  $\times 1$ . b—Fruiting branch,  $\times 1$ . c—Pollen presenter,  $\times 8$ . d—Close up of leaf surface,  $\times 6$ . e—Adaxial view of fruit,  $\times 5$ . f—Abaxial view of fruit,  $\times 5$ . a, c, d drawn from A. S. George 15267; b,e,f drawn from R. Purdie 5342.

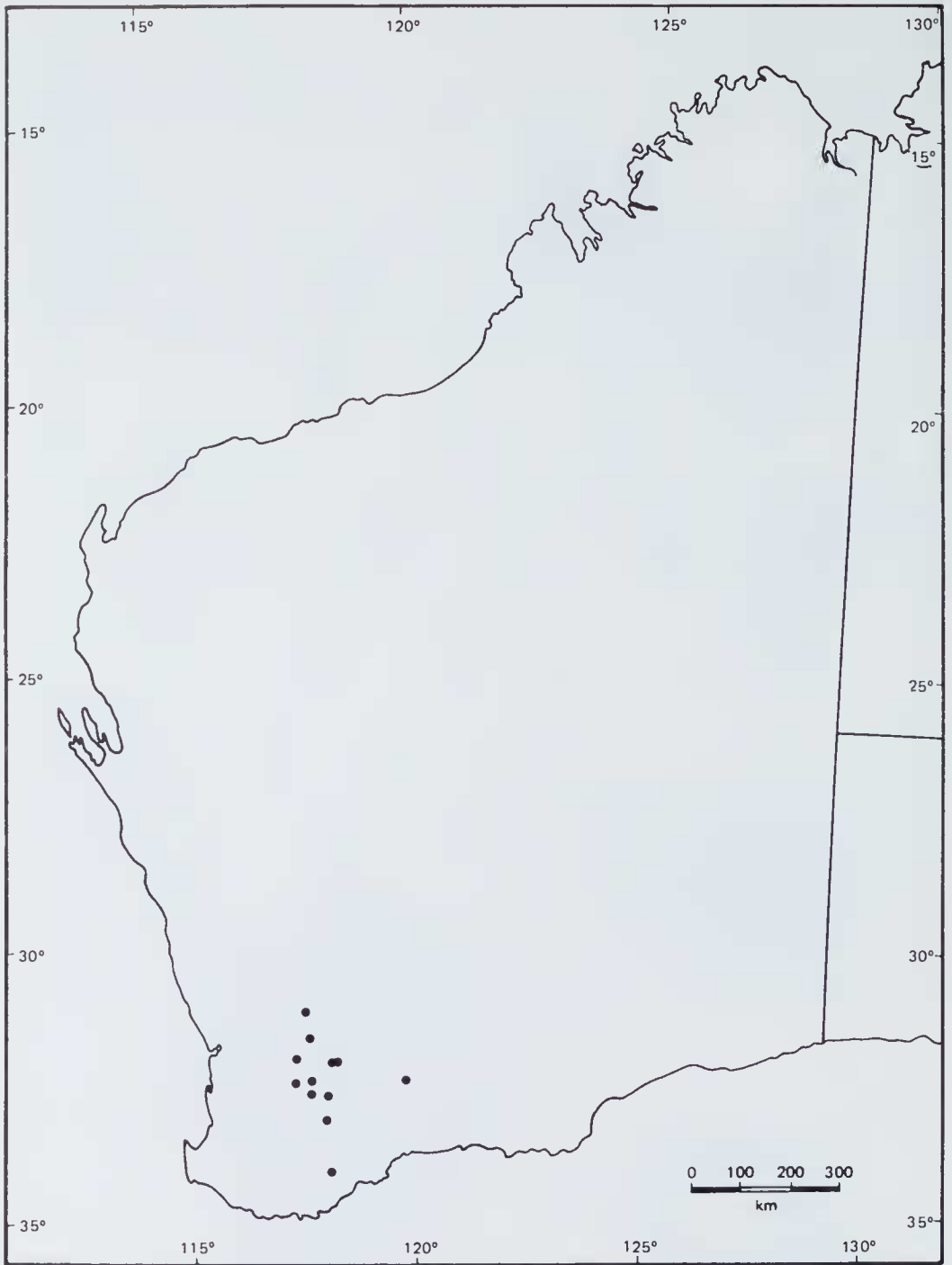


Fig. 4. Distribution of *Petrophile aspera*.

Apart from one collection by C. A. Gardner which indicates a plant 1–1.3 m tall all collections fall within the range 0.2–0.45 m.

This species has been known over a fairly long period and C. A. Gardner recognised it as a distinct entity although never formally validating the name.

Two collections come from reserves, however, the present status of other populations is not known.

## SPECIMENS EXAMINED:

Western Australia—10 miles E of Kukerin, 29.x.1962, *J. S. Beard 2143* (PERTH); Reserve 15637, S of Corrigin, 21.x.1977, *J. S. Beard 8147* (PERTH); 20 miles W of Lake Grace, 11.xi.1931, *W. E. Blackall 1329* (PERTH); near Hatter Hill, -.x.1931, *W. E. Blackall s.n.* (PERTH); Salt River Rd, 17 km W of its junction with Chester Pass Road, 17.x.1985, *M. G. Corrick 9677* (MEL); 33 km W of Lake Grace, 22.xi.1979, *H. Demarz D7864* (CANB n.v., PERTH); Dudinin, -.x.1934, *C. A. Gardner s.n.* (PERTH); Bilbarin, 18.x.1961, *C. A. Gardner 13593* (PERTH); SE of Corrigin, 6.ix.1976, *A. S. George s.n.* (PERTH); Wickepin, -.xi.1969, *B. Gorey s.n.* (PERTH); Dongolocking Reserve, c. 48 km E of Narrogin, 15 km SSE of Toolibin, *B. G. Muir 29* (PERTH); 13.5 km N of Tarin Rock along road to Kulin, 25.ix.1983, *R. W. Purdie 5342* (CBG); Harrismith, 22.x.1972, *E. Wittwer W.869* (PERTH).

***Petrophile stricta*** C. A. Gardner *ex* D. Foreman *sp. nov.*

*Frutex* 0.6–1.6 m altus, erectus, effusus. *Folia* teretia, 4.5–13.5 cm longa, simplicia. *Inflorescentia* terminalis, pedunculata. *Bracteeae involucales* lineares, haud persistentes; squamae strobili latae, pagina exterioris velutina. *Flores* rosei ad cremicolores, extra villosi. *Tepala* c. 10–12 mm longa, unumquidque in apice cum projectura breve acuta c. 1 mm longa. *Pollinis praebitor* fusiformis, c. 5 mm longus, hispidus. *Strobili fructificantes* anguste ovati, 2–4.7 cm longi. *Nuces* late ovatae c. 4 mm longae, c. 4 mm latae, coma pallida, ferruginea ad albida c. 6 mm longa, plerumque in marginibus.

TYPUS: Western Australia, c. 40 km N of Hyden on the Mt Walker South Rd, 22 Nov. 1985, *D. B. Foreman 1164* (HOLOTYPUS: MEL 1545866; ISOTYPI: NSW, PERTH).

*Shrub*, 0.6–1.6 m tall, upright, spreading. *Branchlets* glabrous. *Leaves* glabrous, terete, 4.5–13.5 cm long, unbranched, terminating in a short, sharp point. *Inflorescence* terminal, peduncle 6–12 mm long, c. 1.5–2.0 cm long (excluding flowers) but expanding markedly after flowering. *Involucral bracts* linear, not persisting; cone scales broad, outer surface velvety, inner surface glabrous, tip acuminate, glabrous. *Flowers* pink to cream, villous outside, glabrous inside. *Tepals* c. 10–12 mm long, each topped by a short sharp projection up to c. 1 mm long, glabrous at the tip. *Pollen presenter* fusiform, c. 5 mm long, covered with short stiff hairs. *Fruiting cones* narrow-ovate, 2–4.7 cm long, bracts becoming woody and glabrous. *Nuts* broadly ovate, c. 4 mm long, c. 4 mm wide with a persistent beak up to c. 2 mm, coma pale ferruginous or whitish, c. 6 mm long on the margins, adaxial surface sparsely hairy, abaxial surface covered with short, appressed, whitish hairs. (Fig. 5)

## DISTRIBUTION (Fig. 6):

Found mainly in the drier areas of the SW Botanical province and in the south western interzone (Coolgardie botanical district).

## ECOLOGY:

Collectors notes include 'in mixed sclerophyll scrub on sandy soil', 'laterite, regrowth after fire: *Acacia*, *Grevillea*, *Casuarina*, *Dryandra*', 'shrubland, on yellow sand over laterite', 'scrub on deep sand', 'open scrub . . . , well-drained, deep yellow sand'. Flowers October–December; fruits of previous year persisting until c. November of the following year.

## NOTES:

The epithet refers to the close, straight, upwardly pointing leaves.

Like the preceding species *Petrophile stricta* has long been recognised as a distinct species without ever being formally described. Since many workers appear to know this taxa by the C. A. Gardner manuscript name it seems appropriate to adopt it here.

*Petrophile stricta* is somewhat similar to *Petrophile semifurcata*, both having terete, upwardly pointing leaves, but differs in having thinner leaves which are always simple, a glabrous style, a distinctly fusiform pollen presenter and fruits with a rather dense coma of pale ferruginous hairs up to c. 6 mm long along the margins. The fruits of *P. semifurcata* have a much less dense coma of shorter hairs.



Fig. 5. *Petrophile stricta*. a—Flowering branch,  $\times 1$ . b—Fruiting branch,  $\times 1$ . c—Limb of perianth and pollen presenter,  $\times 3$ . d—Adaxial view of fruit,  $\times 3$ . e—Abaxial view of fruit,  $\times 3$ . a drawn from A. S. George 6038; b-e drawn from holotype.



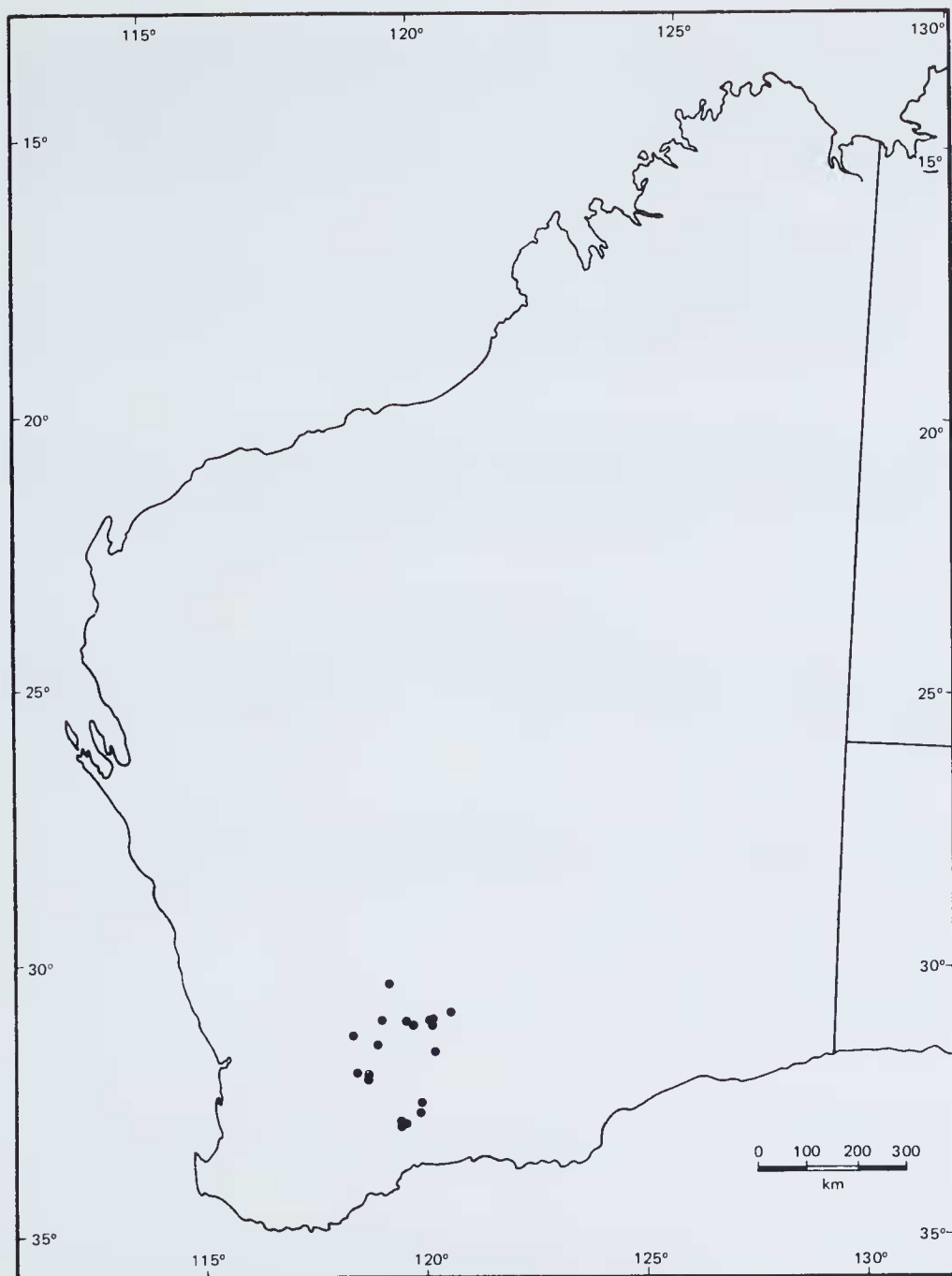


Fig. 6. Distribution of *Petrophile stricta*.

SELECTED SPECIMENS SEEN (Total examined 28):

Western Australia—Mt Holland Road, S of Southern Cross, 2.xi.1931, *W. E. Blackall* 1253, (PERTH); c. 40 km N of Hyden on Mt Walker South Road, 22.xi.1985, *D. B. Foreman* 1163 (CANB, MEL, PERTH, TNS); 14 miles W of Boorabbin, 11.xi.1963, *A. S. George* 6038 (PERTH). Bronti, 242 miles E of Perth, 5.viii.1952, *R. Melville* 159 (BRI, MEL); 17.5 miles S of Bodallin, 13.xi.1986, *B. H. Smith* 811 (MEL); 130 km WSW of Kalgoorlie, 30.x.1974, *D. J. E. Whibley* 4692 (PERTH).

## NOTES ON PETROPHILE BITERNATA MEISSNER

Sainsbury (1987) briefly described and provided photographs of two species of *Petrophile* which he designated *Petrophile* sp. from east of Jurien Bay and *Petrophile* sp. *affin. biternata* from north of Mogumber. As far as I can determine both these entities are referable to *Petrophile biternata* Meissner. The type locality for *Petrophile biternata* is rather vague being given as 'between Moore and Murchison rivers'. All the collections I have seen certainly fall within that general area and field work I undertook during 1984 confirm this observation. The collections I have seen all share a number of common features:

viscid cone scales, particularly the outer ones, the inner ones being densely villous with a glabrous tip;  
glabrous, yellow, viscid flowers, c. 10 mm long; mostly biternate leaves;  
fruits (where present) of all collections match each other and those of *Drummond 6th collection n. 168*, the type of *P. biternata*.

## SPECIMENS EXAMINED:

Western Australia—between Moore and Murchison Rivers, *Drummond VI 168* (ISOTYPE MEL 1534403); 76 miles (c. 121.5 km) N of Perth on Great Northern Highway, S of New Norcia, 16.ix.1973, A. S. George 11701 (MEL); no precise locality, s. dat., *Drummond s.n.* (MEL 1535911, 1535851, 1534179, 1534180, 1534181); on Brand Highway, 11–14 km N of Eneabba, 3.ix.1984, D. B. Foreman 506 (MEL); Rose Thompson Road, 18 km S of Eneabba-Carnamah Rd, 6.ix.1984, D. B. Foreman 558 (MEL, PERTH); c. 9 km S of New Norcia on Great Northern Highway, 14.ix.1984, D. B. Foreman 701 (MEL).

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## REFERENCES

Sainsbury, R. M. (1987) 'A field guide to Isopogons and Petrophiles'. (University of Western Australia Press: Nedlands.)